A STUDY ON KNOWLEDGE, ATTITUDE TOWARDS PULMONARY TUBERCULOSIS AND HEALTH SEEKING BEHAVIOR FOR PULMONARY TUBERCULOSIS SYMPTOMS AMONG URBAN SLUM DWELLERS OF CHENNAI.

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INTRODUCTION

India is the **highest tuberculosis (TB) burden country**[1] accounting for one fifth of the global incidence (Global annual incidence estimate is 9.4 million cases out of which it is estimated that 1.98 million cases are from India). India is 17th among 22 High Burden Countries in terms of TB incidence rate.

It has been acknowledged though that TB control efforts worldwide, although impressive, are not sufficient. The global TB targets – detecting 70% of TB cases and successfully treating 85% of them, and halving the prevalence and mortality of the disease by 2015 as part of the Millennium Development Goals (MDGs) – are likely to be met only if current efforts are intensified[2].

Revised national tuberculosis control programme (RNTCP) has consistently maintained the treatment success rate >85% and case detection rate (CDR) close to the global target of 70%. To maintain these goals requires active community participation by way of creating awareness on the etiology, symptomatology, management, preventive measures, and information of availability of services, etc, for TB[1].

The national Annual Risk Of Tuberculosis Infection (ARTI) was estimated at 1.5% i.e. 75 new smear positive pulmonary TB cases are expected per 100,000 population annually. TB primarily **affects people in their most productive years** with important socio-economic consequences for the household when an individual falls sick with TB. **Poor living conditions**, debility and malnutrition predisposes population to disease[1].

The disease is even more common among the **poorest and marginalized sections of the community**. Almost 70% of TB patients are aged between the ages of **15 and 54 years**. While two thirds of the cases are male[1].

It is envisaged that for consolidation of the TB control measures, needs of **marginalized sections/special groups should be paid special attention.** Knowledge about transmission of infection and how to protect oneself against it is a necessary, but not sufficient, pre-condition. **Research is required** to assess communication needs and **to understand barriers to the desired health-related behavior** in order to develop an optimal communication strategy and design.

A little more than one fourth of the **Chennai** population lives in Slums. Any improvement in the standards of public health will have to start in the Slums[5]. The extreme crowding conditions, lack of proper sanitation, and environmental pollution in very large cities exposes residents, **particularly slum dwellers**, to a high risk of contracting **tuberculosis**, which is a highly contagious disease[4].

Urban slum-dwellers require intensive focus and support from the tuberculosis programme, as these populations often are not able to access timely diagnosis or complete the full duration of anti TB treatment, and hence are at risk of unfavorable treatment outcomes including deaths, defaults, failures and drug resistance[1].

OBJECTIVES

1. To assess knowledge and attitude towards pulmonary tuberculosis among urban slum dwellers of Chennai.

2. To study health seeking behavior for pulmonary tuberculosis symptoms in the above population.

3. To find out the association between knowledge, attitude and health seeking behavior with selected demographic variables like age, sex and educational status.

JUSTIFICATIONS

- Tuberculosis (TB) remains the number one killer infectious disease affecting adults in developing countries[1].
- India is the highest TB burden country and accounts for nearly one-third of the global burden of tuberculosis and two-thirds of the total cases in South-East Asia.
- Knowledge and view point of the beneficiaries are high priority areas to be boosted for enhanced effectiveness of any programme including RNTCP
- Proportions of patients and general population are still unaware of most common presentations &modes of spread of TB, it reflects lack of knowledge about the disease in community[35,36,37]
- A little more than one fourth of the Chennai population lives in Slums. Slum people live in poor living conditions (overcrowding, poor ventilation, pollution, under nutrition etc,). These factors are interrelated and contribute to the occurrence and spread of TB.
- Delay in diagnosis has health provider factors and client factors. The last ones include the health seeking behavior of the population, and this is less known for the community groups with higher risk factors for tuberculosis (poverty, crowding etc.,).

- Delay in diagnosis of pulmonary tuberculosis results in increasing severity, mortality and transmission[16].
- The knowledge of the health seeking behavior and reasons, particularly in TB vulnerable groups (slum population), will facilitate development of adequate strategies and messages to modify health seeking behavior, increase access and reduce delay.
- Lack of studies on knowledge, health seeking behaviors & patient related TB diagnostic delay in Chennai especially in slum population.
- This study is one of the priority research area to improve the case detection and diagnosis proposed by revised operational research (OR committee) agenda in RNTCP for the year 2009-10 [6].
- The present study will serve two important purposes. Firstly it will explore the current knowledge, attitude and health seeking behavior towards TB in more vulnerable slum population. Secondly by studying the current knowledge and attitude towards TB, it will help in contributing to modify (if necessary) the current strategy of awareness creating / behavior change activities under RNTCP.

REVIEW OF LITERATURE

TUBERCULOSIS

Tuberculosis (TB) is a chronic, common, infectious disease caused by the bacteria mycobacterium tuberculosis .Usually the organism primarily affects the lungs resulting in pulmonary tuberculosis[7]. TB is not only a public health problem but also a social and economic problem.

Main Clinical features of TB includes prolonged cough , Fever especially evening rise ,Pain in the chest, Loss of weight ,Loss of appetite and Coughing up of blood. TB spreads through the air. When people, infected with TB germ in lungs (Pulmonary TB) or throat, cough, sneeze, talk or spit, they propel TB germs, known as bacilli, into the air[8].

The number of successful transmissions from infectious cases to susceptible individuals over a defined period of time (usually one year) at a certain calendar time determines the risk of infection in the community during that period. It is estimated that one infectious case, on an average, infects about 10 -15 new cases every year[20].

Early case detection and effective treatment, especially with Directly Observed Treatment Short course (DOTS), not only cure patients but interrupt the transmission of tuberculosis in the community as well[20].

Identification of TB suspects -A pulmonary TB suspect is any person with cough for 2 weeks, or more[1]. Persons with cough for 2 weeks, or more, with or without other symptoms suggestive of TB, should be promptly identified as pulmonary TB suspects and steps taken to subject them to sputum smear microscopy for acid-fast bacilli, for diagnosis of TB.

With increase in incidence of HIV infection, there is increasing focus on HIV-TB co-infection. An HIV infected person co-infected with tubercle bacilli has 50-60% life time risk of developing tuberculosis disease as compared to a 10% life time risk of developing tuberculosis disease in a non- HIV infected person[9].

Magnitude of the problem:

In 2008, there were an estimated 9.4 (range 8.9-9.9million) million incident cases equivalent to 139 cases per 100 000 population of TB globally[2]. This is an increase from the 9.3 million cases estimated to have occurred in 2007. Estimates of the number of cases broken down by age

and sex are being prepared by an expert group as part of an update to the Global Burden of Disease study[10], due to be published in 2010. Provisional analyses indicate that women account for an estimated 3.6 million cases (range, 3.4–3.8 million).

Most of the estimated number of cases in 2008 occurred in Asia (55%) and Africa (30%), with small proportions of cases in the Eastern Mediterranean Region (7%), the European Region (5%) and the Region of the Americas (3%)[2].

India accounts for nearly one-third of the global burden of tuberculosis and two-thirds of the total cases in South-East Asia. Nearly 40 percent of the Indian population is infected with the TB bacillus[20].

In 2008, out of the estimated global annual incidence of 9.4 million TB cases, 1.98 million were estimated to have occurred in India, of whom 0.87 million were infectious cases, thus catering to a fifth of the global burden of TB. About 40% of Indian population is infected with TB bacillus[1].

More than 80% of the burden of tuberculosis is due to premature death, as measured in terms of disability-adjusted life years (DALYs) lost [21].

World Health Organization (WHO) estimated TB mortality in India as 2.76 million (24/100,000 population) in 2008.

TB-related Millennium Development Goal[1]:

Goal 6 – to combat HIV/AIDS, malaria and other diseases

Target 8 – to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases, including tuberculosis.

Indicators for Target 8 to be used to evaluate the implementation and impact of TB control:

Indicator 23: Between 1990 and 2015, to halve the prevalence and death rates associated with tuberculosis; and

Indicator 24: by 2005, to detect 70% of new smear positive TB cases arising annually, and to successfully treat 85% of these cases.

SOCIO-ECONOMIC IMPACT:

Besides the disease burden, TB also causes an enormous socio-economic burden to India. TB primarily affects people in their most productive years of life with important socio-economic consequences for

the household and the disease is even more common among the poorest and marginalized sections of the community[1].

The direct and indirect cost of TB to India amounts to an estimated $23.7 billion annually[15]. Studies suggest that on an average 3 to 4 months of work time is lost as result of TB, resulting in an average lost potential earning of 20-30% of the annual household income. This leads to increased debt burden, particularly for the poor and marginalized sections of the population[15].

A study by WHO in 2000 showed that TB hinders socio-economic development[22].

The disease is most prevalent in the age group 20 to 50 years – the highly economically productive period of an individual's life with important consequences for the household when the individual falls sick with TB[20].

A study from Uganda found that 95% of subsistence farmers with TB reported a loss in production, and 80% of wage earners had stopped work[23].

A study from India indicated that 15% of women with TB faced rejection by their family. The same study found that 8% of rural and 13%

of urban children were taken out of school when a parent (usually father) developed TB. More than half of the TB patients in then prevalence survey were from low socio-economic status, confirming that TB disproportionately affects the poor[24].

A study on the economic impact of scaling up of RNTCP in India in 2009 shows that on an average each TB case incurs an economic burden of around US$ 12,235 and a health burden of around 4.1 DALYs.

WHO STOP TB STRATEGY:

The new WHO Stop TB Strategy, released in 2006, has identified six principal components to realise the global TB related MDGs by 2015. These components were further revised in 2009[1].

1. Pursue high-quality dots expansion and enhancement.
2. Address TB/HIV, MDR-TB, and the needs of poor and vulnerable populations
3. Contribute to health system strengthening based on primary health care
4. Engage all care providers
5. Empower people with TB, and communities through partnership
6. Enable and promote research

ADVOCACY, COMMUNICATION & SOCIAL MOBILIZATION (ACSM)[1]:-

ACSM has been an important component of RNTCP since its launch, but it has assumed greater importance after achieving full coverage of the country in 2006.

ACSM activities are meant to act as enabler for **creating awareness, increasing accessibility and demand for quality services**, and these are to be planned on the basis of needs assessment, identifying processes, implementation and expecting desired outcome. These are 'ongoing' activities for maintaining desired level of awareness, motivation, support and services in patient friendly environment, and like other components of the programme ACSM needs to be **monitored regularly.**

Communication component of RNTCP[3] in Phase II has three main objectives:

1. **Awareness-raising for behavior change** to increase understanding about TB and the use of RNTCP services and preventive action among the public, and medical practitioners across the country

2. **Advocacy** to create, facilitate, develop and forge political, administrative and community-level commitment to TB control in India.

3. **Patient-provider communication and counseling** to help ensure patient compliance with the treatment regimen.

Three basic essential behavioral goals are critical for success, viz.

1. **Treatment-seeking**

General awareness of TB symptoms forms a necessary backdrop for treatment-seeking behavior.

2. **Timely detection**

Treatment-seeking leads the person with symptoms into contact with the health system, where diagnosis can be performed. The earlier the correct diagnosis is established, the sooner the treatment can begin and the patient cease to be a potential source of infection

3. **Completion of treatment**

The treatment for TB is long and must be completed for a patient to be cured. After one or two months of treatment, the symptoms of TB

subside and this often leads to a shift in the patient's priorities. Patients may live in circumstances where earning a living, family responsibilities or job compulsions are seen as more compelling than going to the DOT provider or the health centre. Since it has proved impossible to predict risk of defaulting, it is critical that the patient is given unremitting support and counselling.

Barriers in TB control[3]:

- Low awareness about TB
- Low risk perception
- Misconceptions about cure and treatment
- Fear of TB
- Stigma and discrimination
- Accessibility to services
- Cost of services and treatment
- Attitudes of service providers
- Treatments process and time taken
- Accessibility to services
- Cost of services and treatment

URBAN SLUM DWELLERS AND TB:

In 2002, the United Nations operationally **defined slums** as communities characterized by insecure residential status, poor structural quality of housing, overcrowding, and inadequate access to safe water, sanitation, and other infrastructure (United Nations Human Settlements Program, 2003).

Millennium Development Goals established a target to significantly improve the lives of at least 100 million slum dwellers by the year 2020 (Target11) (United Nations Millennium Project, 2005).

Currently, a sizable proportion of the population in most Indian cities lives in slum areas[4]. According to the **2001 Census**, **42.6 million people lived in slums** in 8.2 million households and 640 towns spread across 26 states and Union Territories in India.

Metropolitan cities in India have recently witnessed a higher population growth rate than other areas due to industrialization and immigration, resulting in the rapid mushrooming of slums[25].

A recently conducted nation-wide study revealed higher risk of tuberculosis infection among slum dwellers, who constitute a high-risk group for TB due to poorer living conditions and nutritional Status[26].

Very few studies have been conducted on the health care seeking patterns of marginal populations residing in slums.

A few studies have highlighted the awareness about TB among the general population in different parts of India such as in Rajasthan[35], rural Tamil Nadu[36], among the chest symptomatics in Tamil Nadu[37] and in slum community of Delhi[38].

A Study conducted in Bangalore slums revealed that the majority of individuals with pulmonary symptoms and TB cases did not know the cause of TB and mode of transmission[27].

The same study also revealed that only 50% of the 124 persons with pulmonary symptoms interviewed had taken action for relief.

The latest surveillance and epidemiological study conducted in 2002 by the Indian Council of Medical Research (ICMR) in Uttar Pradesh, India's most populous state--established this further. The study revealed that 71% of patients diagnosed with TB were from rural areas or were living in urban slums. Only 29% of the patients belonged to middle or high-income groups, and the success rate of treatment for these was far higher by comparison[11].

A study on TB still highly prevalent in RP despite WHO-standard treatment in Philippines revealed that TB continues to be relatively highly prevalent especially in urban unhygienic or slum areas of the Philippines due to such factors as overcrowded and poor hygiene situation, inaccessibility for health workers to enter these areas, insufficient facilities for TB treatment, and discontinued treatment due to frequent relocation of patients[28]

Most important finding in a study conducted in high risk population of America was the lack of appreciation and knowledge that effective treatment of this infection is available[29].

Knowledge on cause of TB was very poor. A study from slum community of Delhi showed that only 2.3% knew that TB was caused by a germ[33].

Study conducted by G. Sudha, C. Nirupa, M. Rajasakthivel et al on Factors influencing the care-seeking behaviour of chest symptomatics highlighted that Fifty-seven per cent of urban chest symptomatics and 43% of the rural chest symptomatics consulted more than one health care provider during the course of their illness. Chest symptomatics commonly switched from one type of health care provider to another. Among urban

symptomatics, a higher proportion of literate participants than illiterate ones sought care[30].

Health seeking behavior and non-adherence to therapy has been cited as major barrier to the control of TB[39-49]. Non-adherence is a complex, dynamic phenomenon with a wide range of interacting factors impacting treatment taking behaviour[44].

DELAY IN DIAGNOSIS:

A single person with infectious TB could infect 10–15 others in a year; therefore, early detection of infectious cases, followed by effective treatment, is imperative for the successful control of tuberculosis[16].

Delay in diagnosis of tuberculosis causes spread of infection in the community, increases patient expenditure, and is associated with a higher risk of mortality[17].

Delays in the diagnosis and treatment of active tuberculosis can be divided into two categories: patient delays and health care system delays[18].

Most patients are found to shop around, from one facility to another, prior to completion of the diagnostic process[19].

TB diagnosis can be delayed when patients postpone seeking care until much after the onset of symptoms (patient delay), or when health providers take more time than required to diagnose patients seeking care (health system delay).

Delays seeking care increase transmission of pulmonary tuberculosis and hence the burden of tuberculosis, which remains high in developing countries. Nearly half of pulmonary tuberculosis patients delayed seeking health care at a public health facility while getting treatment from informal sources[31].

A study from south india by Rajeswari et al[24] showed that Only 22% patients were diagnosed at the health facility where they first sought care; the others shopped around for care at various health facilities before a diagnosis of tuberculosis was made.

Same study also revealed that among patients who delayed care-seeking, a lack of awareness about TB (40%) and poor socioeconomic conditions (36%) were the most common reasons cited for delaying seeking care[16].

Although the new smear-positive case detection rate had reached above 70% in the third and fourth quarters of 2004 (July–December

2004)[32] nationally and in Tamil Nadu, it is important to assess whether these patients are diagnosed and initiated on treatment with minimum delay.

In a passive case finding programme, this is dependent on the health seeking behavior among individuals with chest symptoms and the interval between first contact with a provider and initiation of treatment.

METHODOLOGY

1. STUDY DESIGN:

Community based cross-sectional study.

2. STUDY AREA:

Periya Paalayathu Amman kovil (P.P Amman Kovil), a slum in zone-II of Chennai Corporation.

3. STUDY PERIOD:

From May 2010 to November 2010.

4. STUDY POPULATION:

All men and women aged 15 years and above who consented to participate are included in the study.

Exclusion criteria:

- Those who could not be contacted even after three visits.
- Those who are not willing to participate were excluded from the study.

5. SAMPLE SIZE & SAMPLING METHOD:

SAMPLE SIZE:

The Sample size was calculated on the basis of 42% prevalence rate of knowledge on pulmonary tuberculosis symptom among the urban slum community of delhi by M.Meghachandra singh et al [33], with allowable error of 10% ,using the formula,

$$n = \frac{Z_{alpha}^{2} \; p \times q}{d \times d}$$

n = sample size

Z_{alpha} = Confidence factor $= Z_{0.05} = 1.96$

p= 42%

q= 58%

Limit of accuracy (precision) =10%

d=allowable error =10% of 42%

$$n = \frac{1.96 \times 1.96 \times 42 \times 58}{4.2 \times 4.2}$$

$$= \frac{9358.13}{17.64} = 530$$

Sample size =530

SAMPLING METHOD:

Among 10 Zones of Chennai, Zone II was chosen for logistic reason. There were 123 slums in Zone II (Annexure V) among which P.P amman kovil slum was randomly chosen by lottery method.

P.P amman kovil slum is located in kondithope health post of zone II Chennai corporation. It has a total population of 4927 among which 3853 population (78.2%) were aged 15 years and above .Total number of households were 1127 (source – updated family register of the P.P amman kovil slum –kondithope health post). Average number of eligible persons i.e. persons aged 15 years and above per household were 3853 / 1127 = 3.4

By considering this demography of the local area and assuming that at least one male and one female respondents in my target age group would be present in each household, out of 1127 households, the households needed to be surveyed were at least 265.

The households were selected by **systematic random sampling method**. The sampling interval was calculated as follows:

$$\text{Sampling interval} = \frac{\text{Total number of households in PP amman kovil slum}}{\text{Number of households to be surveyed in PP amman kovil slum}}$$

$$= 1127 / 265 = 4.25 = 4$$

The first household was selected by choosing a first house in the street. The next household was identified by adding the sampling interval with the first household. The subsequent households were selected by same method till sample size is reached.

DEFINITIONS USED IN THE STUDY:

Over crowding[34]:

On the basis of room-person ratio, the accepted standards are,

1 room-2 persons, 2 rooms-3 persons, 3 rooms-5 persons, 4 rooms-7 persons and 5 rooms or more-10 persons. Overcrowding is said to be present if persons per room(s) exceeded the above standards.

Health seeking behavior[13]:

Defined as a 'sequence of remedial actions' taken to rectify 'perceived ill-health'

Cough hygiene[14]:

Covering the mouth and nose with a tissue or using their forearm to cover their mouth when coughing.

6. INSTRUMENT USED IN DATA COLLECTION:

DEVELOPMENT OF QUESTIONNAIRE:

The study was conducted with standardized, pretested semi-structured questionnaire. Source: WHO sample ACSM (Advocacy, communication and social mobilization for TB control) KAP questionnaire[12]. This questionnaire was modified and translated to the local language (Tamil) and pre-tested. The pretested questionnaire in local language was used. (Annexure I). The questionnaire contains 3 parts.

- Part I consists of details of socio demographic profile of the respondents such as age, sex, income , literacy etc.,
- Part II-A consists of questions related to knowledge and awareness of TB. Using the scoring system, level of knowledge was elicited.
- Part II-B questions were related to attitude of the respondents towards TB.

- Part III questions were designed to elicit health seeking behavior for pulmonary tuberculosis symptoms.

SCORING SYSTEM FOR TB KNOWLEDGE:

To assess the knowledge about tuberculosis existed in the study area scoring was given as per the instructions from my guide .TB knowledge was determined by a score of 12 (range 0–12) based on answers given to 12 selected questions, with one point awarded for each correct answer. Those with score between 1-4 was considered of having poor knowledge, those score between 5-8 was considered of having some knowledge and score between 9-12 was considered of having good knowledge about TB.(Annexure-II)

7. DATA COLLECTION

Permission to conduct study was obtained from the Director of Institute of Community Medicine, Madras Medical College; Commissioner of Chennai Corporation; and Health officer- Corporation of Chennai.

The data was collected by household survey by interview method using a semi-structured questionnaire. The purpose of the study was explained to the respondents after a brief introduction .After getting verbal

consent willful respondents were interviewed with questionnaire and information was obtained. If more than one eligible and willful respondents were present at the time of survey, elder one was preferred for interview. In case of non-response or only one eligible respondent present at the time of survey or locked house even after three visits, the next household was chosen to complete the required sample.

DATA ANALYSIS:

Data entry was made in excel software in codes. The entered data was cleaned and validated for consistency. Analysis was done using SPSS 16.0 package.

Prevalence was expressed in percentage and association with factors was tested for significance using Chi square test. While assessing the relationship of TB knowledge and attitude for age group and educational status trend chi-square test was employed. P- value < 0.05 was considered significant. While performing statistical analysis, the similar categories were clubbed together to ease the analysis and interpretation.

RESULTS

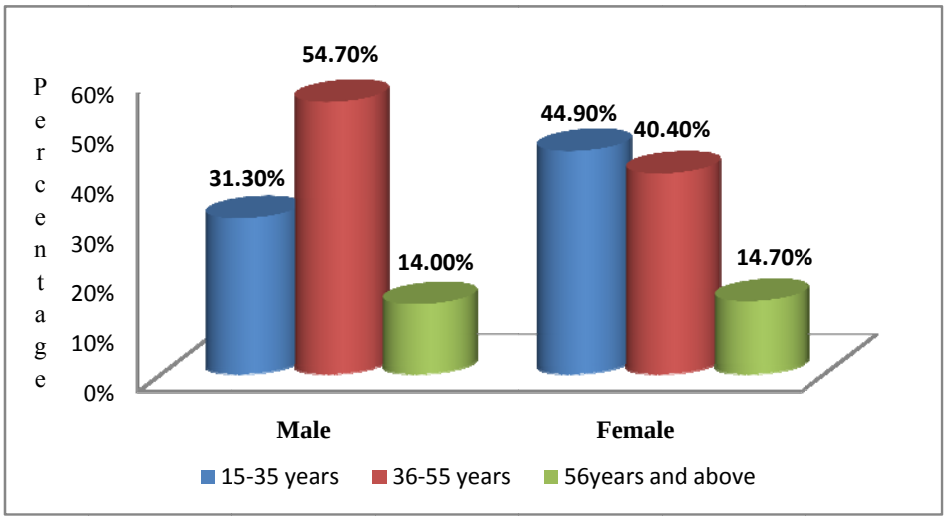
SECTION – A

SOCIO DEMOGRAPHIC PROFILE OF THE STUDY POPULATION

AGE AND SEX COMPOSITION:

Of 530 individuals who participated in the study 265 (50%) were males and 265 (50%) were females. Mean age was 40.03± 11.95.Age group 15–35years age group constituted 38.2% (Males-31.3%, Females-44.9%), 47.5% were between 36 -55 years (Males-54.7%%, Females-40.4%), 14.3% were 56years and above (Males-14%, Females-14.7%). Males in middle age group were in higher proportion compared to females (Fig -1).

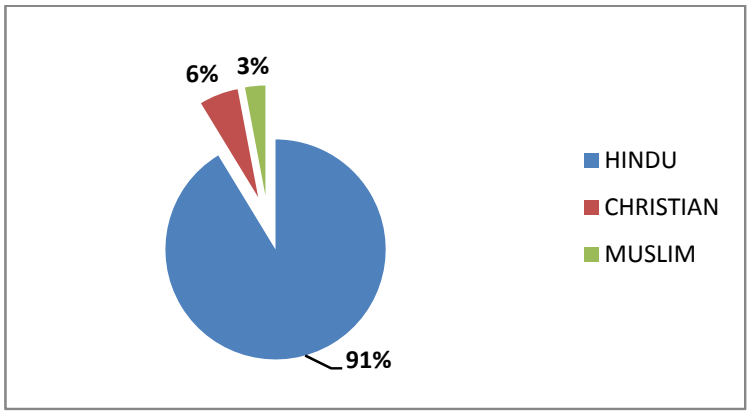
Fig -1 Age and sex composition



RELIGION

Hindus constituted the majority (91%) followed by other religions forming 9% of total. (Fig. 2).

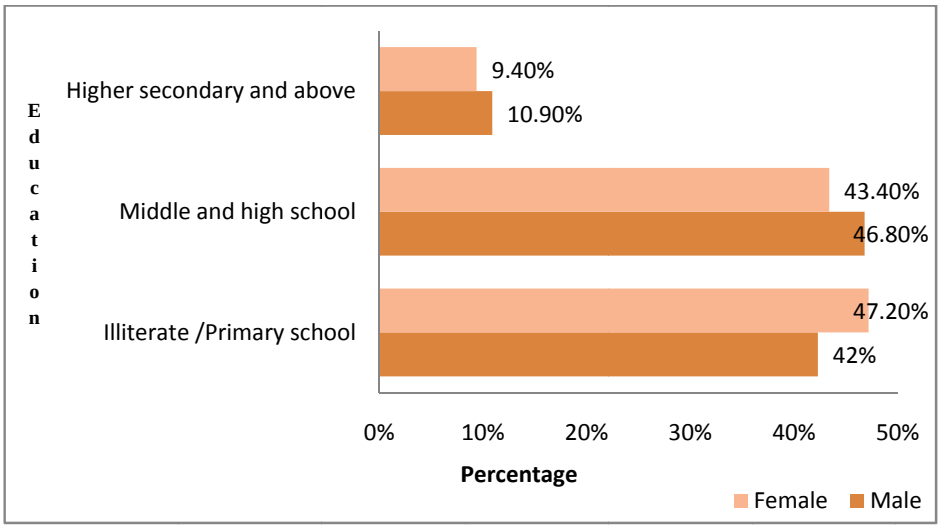
Fig. 2 Religion



EDUCATIONAL STATUS

In this study area 44.7% were illiterates and primary schooling (Males-42%, Females-47.2%), 45.1% had middle and high school education (Males-46.8%, Females-43.4%) and only 10.2 % had higher secondary education and above. Male population had slightly better educational status than female population (Fig.3).

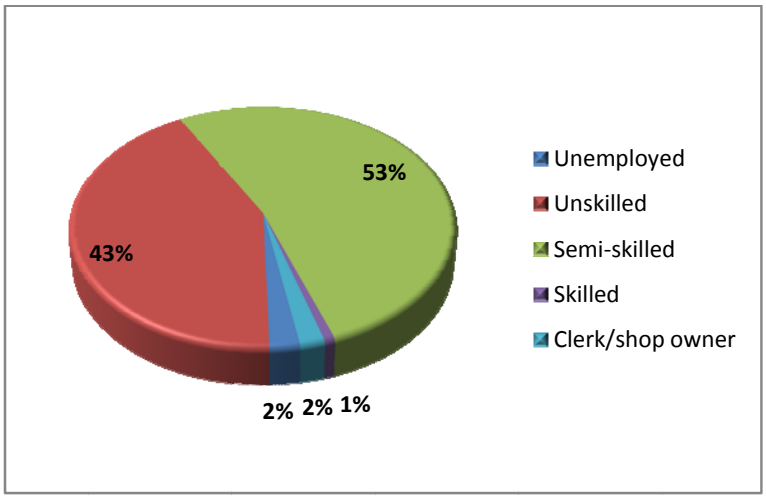
Fig. 3 Educational status



OCCUPATION

In the study population 2.3% were unemployed[#], 42.5% of the study population were unskilled workers, 52.5% were semiskilled[*] worker and other contributes 2.7%. Occupational status shown in Fig.4.

Fig. 4 Occupational status



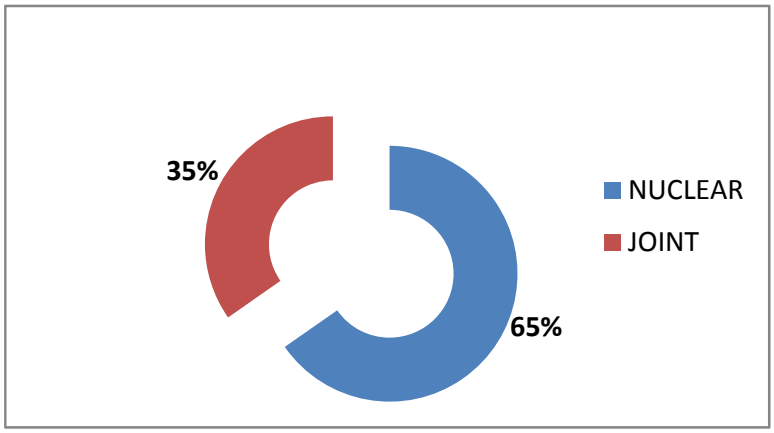
#student /old age dependant were included in unemployed.

*Home makers included in semi skilled worker.

TYPE OF FAMILY

65.3% of the study population belonged to nuclear family, 34.7% were living in joint family (Fig.5)

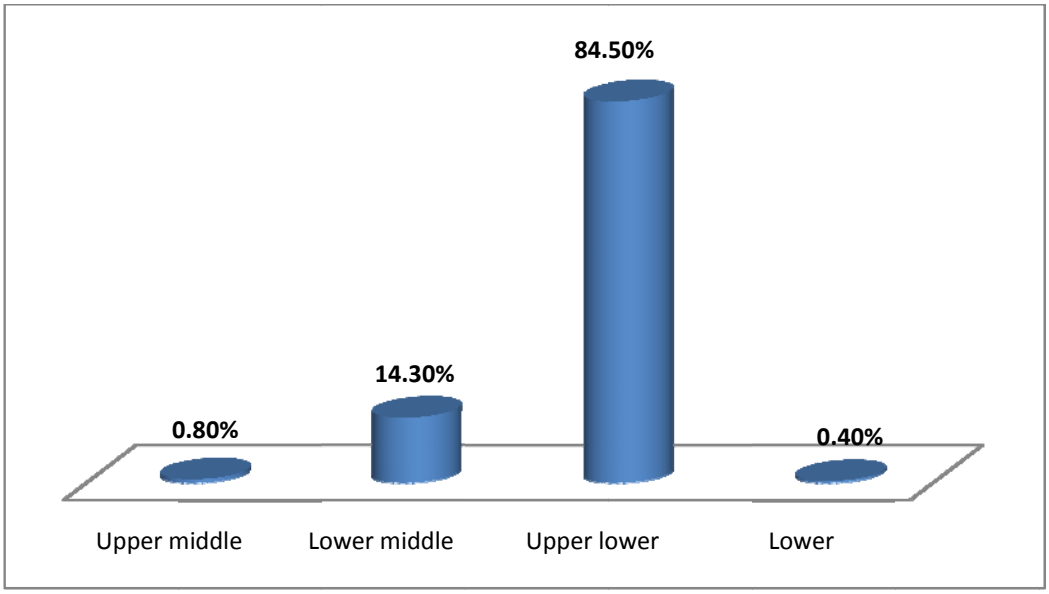
Fig.5 Type of family



SOCIO ECONOMIC STATUS

Based on Modified Kuppusamy scale, the study population was divided into following socioeconomic class (Annexure II). Upper lower class constituted 84.5% followed by lower middle class which constituted 14.3% where as upper middle class and lower class formed 0.8% and 0.4% respectively.(Fig.6)

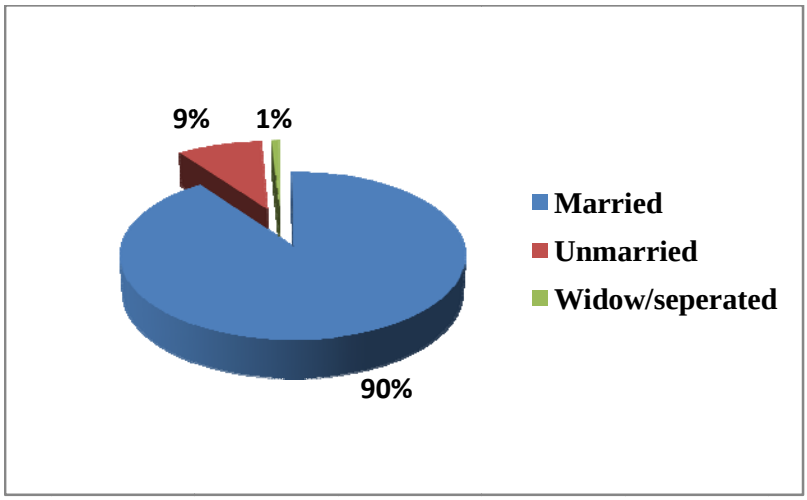
Fig. 6 Socio-Economic Status



MARITAL STATUS

Marital status (Fig.7) shows 90.1% were married and 9.1% were unmarried.

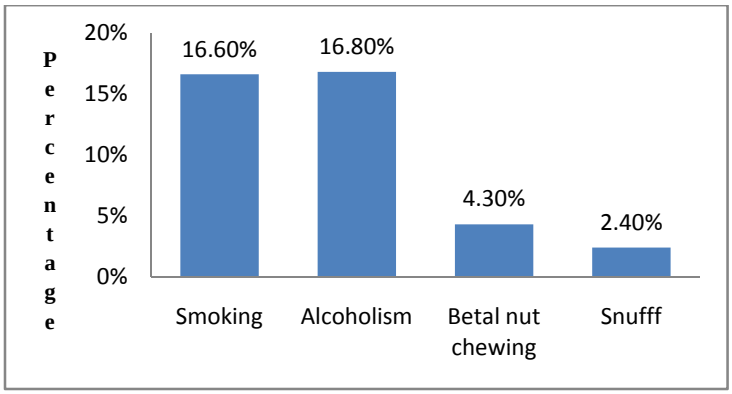
Fig.7 Marital status



PERSONAL HABITS

In the study population habit of smoking and alcohol was present 16.6% and 16.8% respectively. (Among males, smokers- 33% , alcoholics- 33.5%). Minority of study population having the habit of betal nut chewing (4.3%) and using snuff (2.4%). (Fig.8)

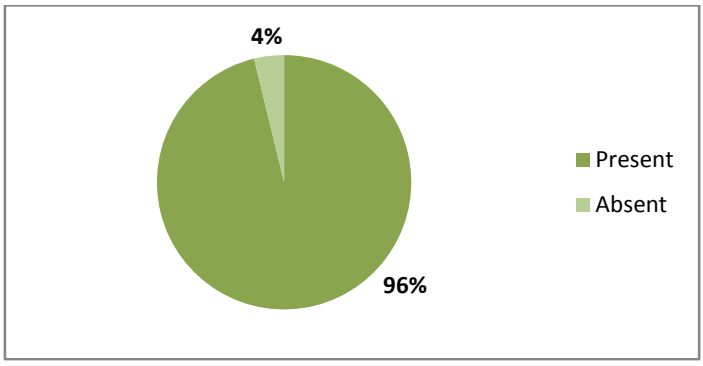
Fig.8 Personal habits



OVERCROWDING

Overcrowding was present in 96 % of households in the study area. (fig.9)

Fig.9 Overcrowding



SECTION-B

GENERAL AWARENESS / KNOWLEDGE ABOUT TB:

The respondents were found to be well aware about the name of TB (98.7%). When they were asked who was more susceptible to TB, the most frequently mentioned susceptible was anybody (81.8%). Majority (85.5%) were aware that TB is a communicable disease.

TB was considered as serious and very serious disease widely (80.9%) and majority of respondents cited that TB was curable disease (83.7%). Half of the respondents (50.1%) reported that hospitalization is necessary for treatment of TB. Only 6.3% of study population have heard about DOTS centre. More than three fourth of the study population (78.4%) were aware that treatment was given free of cost at the government health facilities. Only 23.7 % of respondents had received some information related to TB in the past month and when they were asked about the sources of TB information, Hospital/health workers (50%) and mass media (26.6%) were the major sources of information. (Table.1)

Table-1. Awareness / General knowledge about TB.

Sl. No.	Variables		N	%
1.	Heard about TB		523*	98.7
2.	TB can affect	- Anybody	428	81.8
		- Only poor/homeless	36	6.8
		- Only Smokers	9	1.7
		- Others/Don't Know	50	9.7
3.	TB is communicable disease		447	85.5
4.	Seriousness of TB	- Very Serious	241	46.1
		- Somewhat Serious	182	34.8
		- Not Serious	100	19.1
5.	TB can be cured	- Yes	438	83.7
		- No	13	2.3
		- Don't Know	72	13.8
6.	Hospitalization is necessary for treatment	- Yes	262	50.1
		- No	238	45.5
		- Don't Know	23	4.4
7.	Heard about DOTS center	- Yes	33	6.3
		- No	490	93.7
8.	Cost Of TB diagnosis and treatment	- Free Of Cost	410	78.4
		- Reasonably Priced	76	14.5
		- Expensive	11	2.1
		- Don't Know	26	5.0
9.	Have received TB information in the past month	- Yes	124	23.7
		- No	399	76.3
10.	Sources of information (n=124)	- Hospital / Health Worker	62	50.0
		- Mass Media	33	26.6
		- Both Hospital & Mass Media	11	8.9
		- Relatives / Friends	18	14.5

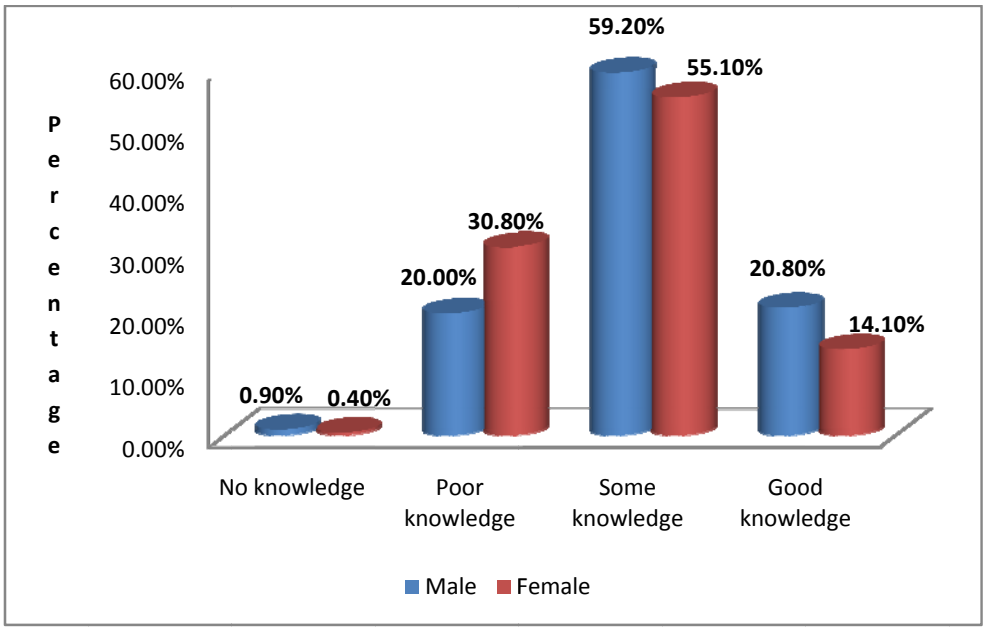
***** Out of 530 individuals interviewed 523 respondents were aware of name TB so these 523 respondents were interviewed further about knowledge

about TB, attitude towards TB and health seeking behavior for TB symptoms.

PREVALENCE OF TB KNOWLEDGE:

In the study population, poor knowledge was seen in 25.4% (M-20% F-30.8%) and some knowledge was seen in 57.2% (M-59.2% F-55.1%) of population. Only 17.4% of study population (M-20.8% F-14.1%) had good knowledge about tuberculosis. Knowledge about pulmonary tuberculosis shown in the Fig 10 clearly shows males had slightly better knowledge than females. (M-Male, F-Female)

Fig.10 Knowledge about tuberculosis.



RELATIONSHIP OF TB KNOWLEDGE WITH AGE, SEX AND EDUCATION:

Relationship of TB knowledge with socio-demographic variables shows that good knowledge significantly increased $\chi 2$ for linear trend= 191.458, $p<0.001$ with the rise in literacy status, being 2.6% among illiterate/ primary schooling individuals, 17.6% among those with middle/high school education, and 79.6% among those higher secondary schooling and above. Same trend was also observed in lesser age group than older age group $\chi 2$ for linear trend= 96.944, $p<0.001$.

Male population had better knowledge than female population with 20.8% good knowledge in males compared to 14% good knowledge in females ($p <0.05$) (Table.2)

Table 2: Relationship of TB knowledge score with age, sex and education

Demographic Variables	TB Knowledge Score			Total	Chi-square value	P-value
	Poor	Some	Good			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	30 (15.1)	92 (46.2)	77 (38.7)	199 (100.0)		
36-55 years	61 (24.2)	177 (70.2)	14 (5.6)	252 (100.0)		
56 + yrs	42 (58.3)	30 (41.7)	-	72 (100.0)	96.944	<0.001
Total	**133 (25.4)**	**299 (57.2)**	**91 (17.4)**	**523 (100.0)**		
Sex						
Male	52 (20.0)	154 (59.2)	54 (20.8)	260 (100.0)		
Female	81 (30.8)	145 (55.1)	37 (14.1)	263 (100.0)	9.753	<0.001
Total	**133 (25.4)**	**299 (57.2)**	**91 (17.4)**	**523 (100.0)**		
Education						
Illiterate / Primary School	116 (50.4)	108 (47.0)	6 (2.6)	230 (100.0)		
Middle School + High School	13 (5.4)	184 (77.0)	42 (17.6)	239 (100.0)	191.458	<0.001
Higher Secondary and above	4 (7.4)	7 (13.0)	43 (79.6)	54 (100.0)		
Total	**133 (25.4)**	**299 (57.2)**	**91 (17.4)**	**523 (100.0)**		

KNOWLEDGE ABOUT TB AND PERSONAL HABITS:

Better TB knowledge was found among male non-smokers and non-alcoholics when compared to male smokers and alcoholics. P <0.001 (Table 3& 4)

Table.3 Knowledge about TB and Personal Habits: Smoking

Knowledge about TB	Personal Habits: Smoking				Total		Chi-Square value	P - value
	Yes		No					
	n	%	n	%	n	%		
Poor	37	42.5	15	8.7	52	20.0	43.256	<0.001
Moderate	41	47.1	113	65.3	154	59.2		
Good	9	10.3	45	26.0	54	20.8		
Total	87	100.0	173	100.0	260	100.0		

Table.4 Knowledge about TB and Personal Habits: Alcohol

Knowledge about TB	Personal Habits: Alcohol				Total		Chi-Square value	P - value
	Yes		No					
	n	%	n	%	n	%		
Poor	14	15.7	38	22.2	52	20.0	28.134	<0.001
Moderate	71	79.8	83	48.5	154	59.2		
Good	4	4.5	50	29.2	54	20.8		
Total	89	100.0	171	100.0	260	100.0		

RELATIONSHIP OF KNOWLEDGE OF SYMPTOMS AND CAUSE WITH AGE, SEX AND EDUCATION:

As much as 24.3% of the individuals were not aware about any symptoms of tuberculosis. Younger age group and those with higher educational status have identified more TB symptoms including cough and

was found to be statistically significant with P-value of <0.001 and <0.05 respectively. Male population (29.6%) mentioned more TB symptoms than female (26.2%) and it was found to be statistically significant with P-value of <0.05. (Table.5)

Only 6.9% of study population knew that germ was the cause for TB. Considerable amount of study population (35.6%) did not know the cause. Half of respondents (53%) believed that TB is due to smoking /dirt and this was observed to be significantly greater among males, middle age groups and those with middle and high schooling (p <0.05). (Table 6)

Table-5 : Relationship of knowledge of TB symptoms with age, sex and education.

Demographic Variables	Symptoms of TB				Total	Chi-square value	P-value
	Cough	Cough + other TB symptoms(s)#	TB symptoms other than cough	Don't know / wrong			
	n (%)	n (%)	n (%)	n (%)	n (%)		
Age Group							
15-35 years	76 (38.2)	91 (45.7)	4 (2.0)	28 (14.1)	199(100)		
36-55 years	143 (56.7)	40 (15.9)	12 (14.8)	57 (22.6)	252 (100)	26.649	< 0.001
56 years & above	14 (19.4)	15 (20.8)	1 (1.4)	42 (58.3)	72 (100)		
Total	**233 (44.6)**	**146 (27.9)**	**17 (3.3)**	**127 (24.3)**	**523 (100)**		
Sex							
Male	103 (39.6)	77 (29.6)	4 (1.5)	76 (29.2)	260 (100)	13.236	0.004
Female	130 (49.4)	69 (26.2)	13 (4.9)	51 (19.4)	263 (100)		
Total	**233 (44.6)**	**146 (27.9)**	**17 (3.3)**	**127 (24.3)**	**523 (100)**		
Education							
Illiterate / Primary School	115 (50.0)	29 (12.6)	11 (4.8)	75 (32.6)	230 (100)		
Middle + High School	111 (46.4)	72 (30.1)	6 (2.5)	50 (20.9)	239 (100)	4.032	0.045
Higher Secondary and above	7 (13.0)	45 (83.3)	-	2 (3.7)	54 (100)		
Total	**233(44.6)**	**146 (27.9)**	**17 (3.3)**	**127 (24.3)**	**523 (100)**		

[#] other TB symptoms includes fever, weight loss, pain in the chest, coughing up blood.

Cough was the major symptom identified by the respondents (72.5%), followed by fever (32.4%), Breathlessness (31%), loss of weight (16.4%), Coughing up blood (10.7%) and Pain in the chest (4%).

Table-6: Relationship of knowledge of cause of TB with age, sex and education.

Demographic Variables	Cause of TB				Total	Chi-square value	P-value
	Germ	Smoking / dirt	Hereditary	Don't know / wrong			
	n (%)	n (%)	n (%)	n (%)	n (%)		
Age Group							
15-35 years	33 (16.6)	83 (41.7)	3 (1.5)	80 (40.2)	199 (100)		
36-55 years	3 (1.2)	166 (65.9)	21 (8.3)	62 (24.6)	252 (100)	8.061	0.005
56 years & above	-	28 (38.9)	-	44 (61.1)	72 (100)		
Total	**36 (6.9)**	**277 (53.0)**	**24 (4.6)**	**186 (35.6)**	**523 (100)**		
Sex							
Male	16 (6.2)	152 (58.5)	15 (5.8)	77 (29.6)	260 (100)	10.065	0.018
Female	20 (7.6)	125 (47.5)	9 (3.4)	109 (41.4)	263 (100)		
Total	**36 (6.9)**	**277 (53.0)**	**24 (4.6)**	**186 (35.6)**	**523 (100)**		
Education							
Illiterate / Primary School	6 (2.6)	97 (42.2)	15 (6.5)	112 (48.7)	230 (100)		
Middle + High School	7 (2.9)	163 (68.2)	8 (3.3)	61 (25.5)	239 (100)	48.569	< 0.001
Higher Secondary and above	23 (42.6)	17 (31.5)	1 (1.9)	13 (24.1)	54 (100)		
Total	**36 (6.9)**	**277 (53.0)**	**24 (4.6)**	**186 (35.6)**	**523 (100)**		

RELATIONSHIP OF KNOWLEDGE OF DIAGNOSIS AND TREATMENT OF TB WITH AGE, SEX AND EDUCATION:

Populations were asked the question on commonly used diagnostic test and treatment of Pulmonary tuberculosis. The most common knowledge on diagnostic test for TB was found to be sputum examination (65.2%) Male had little higher knowledge (70%) than female (60.5%) and this was statistically significant with p value <0.05. (Table.7).

Table 8 revealed that most of the study population (88.1%) were well aware that specific drugs available for treatment of tuberculosis. There is linear association exists between knowledge on diagnostic test and treatment with age group / literacy rate. As the literacy rate i.e. schooling level increases knowledge also increases. Similarly younger the age group better the knowledge ($p < 0.001$).

Table-7 : Relationship of knowledge of diagnosis with age, sex and education

Demographic Variables	Tuberculosis commonly diagnosed by			Total	Chi-square value	P-value
	Sputum Examination	Others[#]	Don't know			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	154 (77.4)	32 (16.1)	13 (6.5)	199 (100.0)		
36-55 years	169 (67.1)	44 (17.5)	39 (15.5)	252 (100.0)		
56 + yrs	18 (25.0)	15 (20.8)	39 (54.2)	72 (100.0)	71.364	<0.001
Total	**341 (65.2)**	**91 (17.4)**	**91 (17.4)**	**523 (100.0)**		
Sex						
Male	182 (70.0)	34 (13.1)	44 (16.9)	260 (100.0)		
Female	159 (60.5)	57 (21.7)	47 (17.9)	263 (100.0)	7.446	0.024
Total	**341 (65.2)**	**91 (17.4)**	**91 (17.4)**	**523 (100.0)**		
Education						
Illiterate / Primary School	88 (38.3)	62 (27.0)	80 (34.8)	230 (100.0)		
Middle School + High School	202 (84.5)	27 (11.3)	10 (4.2)	239 (100.0)	118.227	<0.001
Higher Secondary and above	51 (94.4)	2 (3.7)	1 (1.9)	54 (100.0)		
Total	**341 (65.2)**	**91 (17.4)**	**91 (17.4)**	**523 (100.0)**		

others includes blood, urine examination and x-ray chest.

Table-8 : Relationship of knowledge of treatment with age, sex and education

Demographic Variables	TB can be cured by		Total	Chi-square value	P-value
	Specific drugs	Don't know / Others			
	N (%)	N (%)	N (%)		
Age Group					
15-35 years	166 (96.5)	6 (3.5)	172 (100.0)	39.307	<0.001
36-55 years	203 (86.8)	31 (13.2)	234 (100.0)		
56 + yrs	17 (53.1)	15 (46.9)	32 (100.0)		
Total	386 (88.1)	52 (11.9)	438 (100.0)		
Sex					
Male	192 (81.7)	43 (18.3)	235 (100.0)	20.010	<0.001
Female	194 (95.6)	9 (4.4)	203 (100.0)		
Total	386 (88.1)	52 (11.9)	438 (100.0)		
Education					
Illiterate / Primary School	141 (82.5)	30 (17.5)	171 (100.0)	12.60	<0.001
Middle School + High School	193 (89.8)	22 (10.2)	215 (100.0)		
Higher Secondary and above	52 (100.0)		52 (100.0)		
Total	386 (88.1)	52 (11.9)	438 (100.0)		

Not much respondents had knowledge on 6-8-month TB treatment course (15.5%). Majority of study population (68.4%) did not know the duration of TB treatment. (Table.9)

Table 9. Duration of treatment of tuberculosis.

Duration of treatment	N	%
Less than 6 months	62	16.1
6 months to 8 months	60	15.5
Do not know / others	264	68.4
Total	386	100

RELATIONSHIP OF KNOWLEDGE OF SPREAD AND PREVENTION OF TB TRANSMISSION WITH AGE, SEX AND EDUCATION:

Almost half of study population (49.1%) mentioned cough hygiene and regular treatment for prevention of transmission of TB to others. (Table 10). Air borne (61.2%) was the most common mode of spread cited by the study population. Around 10% of study population did not know the spread and more than one fourth of population (28.9%) had wrong perception about spread of TB like spread through sharing utensils, direct contact with sputum of TB patients. (Table 11).

Male population, younger age and those with higher educational status have better knowledge in this regard. This found out to be statistically highly significant ($p < 0.001$) (Table 12)

Table 10. Methods to prevent transmission of TB to others.

Preventing transmission of TB	**N**	**%**
Cough hygiene / regular treatment	257	49.1%
Using separate utensils / isolating the patient	77	14.7%
Do not know	162	31.0%
Others	27	5.2%
Total	**523**	**100.0%**

Table-11 :Relationship of knowledge of spread of TB with age, sex and Education

Demographic Variables	**Tuberculosis spread in the community through**			**Total**	**Chi-square value**	**P-value**
	Air borne	**Others#**	**Don't know**			
	N (%)	**N (%)**	**N (%)**	**N (%)**		
Age Group						
15-35 years	142 (71.4)	51 (25.6)	6 (3.0)	199 (100.0)	51.991	< 0.001
36-55 years	161 (63.9)	66 (26.2)	25 (9.9)	252 (100.0)		
56 + yrs	17 (23.6)	34 (47.2)	21 (29.2)	72 (100.0)		
Total	**320 (61.2)**	**151 (28.9)**	**52 (9.9)**	**523(100.0)**		
Sex						
Male	198 (76.2)	41 (15.8)	21 (8.1)	260 (100.0)	51.487	< 0.001
Female	122 (46.4)	110 (41.8)	31 (11.8)	263 (100.0)		
Total	**320 (61.2)**	**151 (28.9)**	**52 (9.9)**	**523 (100.0)**		
Education						
Illiterate / Primary School	98 (42.6)	86 (37.4)	46 (20.0)	230 (100.0)	68.484	< 0.001
Middle School + High School	176 (73.6)	58 (24.3)	5 (2.1)	239 (100.0)		
Higher Secondary and above	46 (85.2)	7 (13.0)	1 (1.9)	54 (100.0)		
Total	**320 (61.2)**	**151 (28.9)**	**52 (9.9)**	**523 (100.0)**		

using the utensils of TB patients and direct contact with sputum of TB patients.

Table-12 : Relationship of knowledge of prevention with age, sex and Education

Demographic Variables	Methods to prevent transmission of TB			Total	Chi-square value	P-value
	Cough Hygiene & Regular treatment	Others#	Don't know			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	138 (69.3)	25 (12.6)	36 (18.1)	199 (100.0)		
36-55 years	93 (36.9)	69 (27.4)	90 (35.7)	252 (100.0)		
56 + yrs	26 (36.1)	10 (13.9)	36 (50.0)	72 (100.0)	42.789	<0.001
Total	**257 (49.1)**	**104 (19.9)**	**162 (31.0)**	**523 (100.0)**		
Sex						
Male	154 (59.2)	42 (16.2)	64 (24.6)	260 (100.0)		
Female	103 (39.2)	62 (23.6)	98 (37.3)	263 (100.0)	21.086	<0.001
Total	**257 (49.1)**	**104 (19.9)**	**162 (31.0)**	**523 (100.0)**		
Education						
Illiterate / Primary School	53 (23.0)	61 (26.5)	116 (50.4)	230 (100.0)		
Middle School + High School	159 (66.5)	37 (15.5)	43 (18.0)	239 (100.0)	108.449	<0.001
Higher Secondary and above	45 (83.3)	6 (11.1)	3 (5.6)	54 (100.0)		
Total	**257 (49.1)**	**104 (19.9)**	**162 (31.0)**	**523 (100.0)**		

includes isolation and using separate utensils for TB patients.

SECTION-C

ATTITUDE TOWARDS TB:

Table 12 shows that attitude of study population towards tuberculosis and tuberculosis patients. When they were asked whether you can get TB, nearly half of population (47.4%) agreed that anyone can get TB. Majority (87.4%) accepted that poor patients can also get cured of TB.

Considerable proportion of study population (32.3%) urged that TB patients should be isolated and they should be restricted to use the public utilizing places (38.4%).

TB patients should avoid marriage which was cited by 23.3% of study population. Only 14% knew that TB affected mother can breast fed her baby whereas 36.1% of study population opposed this. Half of study population did not know TB affected mother can breast fed her baby. When they were asked about how people with TB regarded in your community majority cited (45.7%) that community will support them.

Table-12 : Attitude towards TB

Variables	Response	N	%
Respondent can get TB infection	Yes	248	47.4
	No	139	26.6
	Don't know	136	26.0
Poor patients can get cured of Tuberculosis	Yes	457	87.4
	No	15	2.9
	Don't know	51	9.8
Persons with TB can marry	Yes	322	61.6
	No	122	23.3
	Don't know	79	15.1
Persons with TB should be isolated	Yes	169	32.3
	No	342	65.4
	Don't know	12	2.3
Person who has TB in your area usually regarded/treated	Most people reject him/her	81	15.5
	Most people are friendly, but try to avoid him/her	202	38.6
	Community mostly supports and helps him/her	239	45.7
	Others	1	0.2
Persons with TB, can visit public utilizing places like cinema hall, market, temple etc.,	Yes	275	52.6
	No	201	38.4
	Don't know	47	9.0
TB affected mother can breast feed her baby	Yes	73	14.0
	No	189	36.1
	Don't know	261	49.9
Total		**523**	**100.0**

RELATIONSHIP OF ATTITUDE TOWARDS TB WITH AGE, SEX AND EDUCATION:

a. Attitude – TB affected persons can marry/ TB patients can visit public places:

Population were asked about whether TB persons can marry majority (61.6%) agreed that they can marry and more than half of respondents (52.6%) cited that they can visit public utilizing places like cinema hall, market, temples etc., and and this attitude significantly higher among males, younger and middle age population and those with higher educational status. ($p < 0.001$) (Table 13&14).

b. Attitude – TB patients should be isolated:

Less than one third of study population (32.3%) said that TB patients should be isolated and these attitudes observed to be higher among females than males ($p<0.05$), older people than younger and those with lesser educational status. ($p < 0.001$) (Table-15).

Table-13 : Attitude towards TB - "TB persons can marry"

Demographic Variables	Persons with TB can marry			Total	Chi-square value	P-value
	Yes	No	Don't know			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	139 (69.8)	45 (22.6)	15 (7.5)	199 (100.0)		
36-55 years	154 (61.1)	37 (14.7)	61 (24.2)	252 (100.0)	11.471	<0.001
56 + yrs	29 (40.3)	40 (55.6)	3 (4.2)	72 (100.0)		
Total	**322 (61.6)**	**122 (23.3)**	**79 (15.1)**	**523 (100.0)**		
Sex						
Male	176 (67.7)	40 (15.4)	44 (16.9)	260 (100.0)		
Female	146 (55.5)	82 (31.2)	35 (13.3)	263 (100.0)	18.263	<0.001
Total	**322 (61.6)**	**122 (23.3)**	**79 (15.1)**	**523 (100.0)**		
Education						
Illiterate / Primary School	114 (49.6)	80 (34.8)	36 (15.7)	230 (100.0)		
Middle School + High School	156 (65.3)	40 (16.7)	43 (18.0)	239 (100.0)	25.076	<0.001
Higher Secondary and above	52 (96.3)	2 (3.7)		54 (100.0)		
Total	**322 (61.6)**	**122 (23.3)**	**79 (15.1)**	**523 (100.0)**		

Table-14 : Attitude towards TB - "TB persons can visit public utilizing places"

Demographic Variables	TB persons can visit public utilizing places			Total	Chi-square value	P-value
	Yes	No	Don't know			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	133 (66.8)	56 (28.1)	10 (5.0)	199 (100.0)		
36-55 years	114 (45.2)	117 (46.4)	21 (8.3)	252 (100.0)	30.222	<0.001
56 + yrs	28 (38.9)	28 (38.9)	16 (22.2)	72 (100.0)		
Total	**275 (52.6)**	**201 (38.4)**	**47 (9.0)**	**523 (100.0)**		
Sex						
Male	156 (60.0)	65 (25.0)	39 (15.0)	260 (100.0)		
Female	119 (45.2)	136 (51.7)	8 (3.0)	263 (100.0)	50.489	<0.001
Total	**275 (52.6)**	**201 (38.4)**	**47 (9.0)**	**523 (100.0)**		
Education						
Illiterate / Primary School	103 (44.8)	103 (44.8)	24 (10.4)	230 (100.0)		
Middle School + High School	123 (51.5)	93 (38.9)	23 (9.6)	239 (100.0)	22.778	<0.001
Higher Secondary and above	49 (90.7)	5 (9.3)		54 (100.0)		
Total	**275 (52.6)**	**201 (38.4)**	**47 (9.0)**	**523 (100.0)**		

Table-15 : Attitude towards TB - "TB persons should be isolated"

Demographic Variables	Persons with TB should be isolated			Total	Chi-square value	P-value
	Yes	No	Don't know			
	N (%)	N (%)	N (%)	N (%)		
Age Group						
15-35 years	33 (16.6)	163 (81.9)	3 (1.5)	199 (100.0)		
36-55 years	109 (43.3)	136 (54.0)	7 (2.8)	252 (100.0)		
56 + yrs	27 (37.5)	43 (59.7)	2 (2.8)	72 (100.0)	17.815	<0.001
Total	**169 (32.3)**	**342 (65.4)**	**12 (2.3)**	**523 (100.0)**		
Sex						
Male	66 (25.4)	189 (72.7)	5 (1.9)	260 (100.0)		
Female	103 (39.2)	153 (58.2)	7 (2.7)	263 (100.0)	12.207	<0.002
Total	**169 (32.3)**	**342 (65.4)**	**12 (2.3)**	**523 (100.0)**		
Education						
Illiterate / Primary School	109 (47.4)	112 (48.7)	9 (3.9)	230 (100.0)		
Middle School + High School	57 (23.8)	179 (74.9)	3 (1.3)	239 (100.0)	33.840	<0.001
Higher Secondary and above	3 (5.6)	51 (94.4)	--	54 (100.0)		
Total	**169 (32.3)**	**342 (65.4)**	**12 (2.3)**	**523 (100.0)**		

SECTION- D

HEALTH SEEKING BEHAVIORS FOR PULMONARY TB SYMPTOMS:

In this section respondents were asked about health seeking behavior for TB symptoms. Only just over half of study population (58.5%) would go to health facility if they had prolonged cough. Nearly 40% of respondents said they would either go to pharmacy (28.9%) or pursue self treatment options (10.3%). If had symptoms of TB majority (89%) would seek health facility at the different point of time. Major reaction if they had TB would be sadness (41%). (Table 16). Preference of health facility would be private in 48.7% of respondents. Major reason for not going to government health facility was long waiting time (51%). (Table 17).

Table - 16 : Health seeking behaviors for Pulmonary TB symptoms

Variables	Response	N	%
➢ If had prolonged cough, would thought to	Go to health facility	306	58.5
	Go to pharmacy	151	28.9
	Pursue other self-treatment options (herbs, etc.)	54	10.3
	Others	12	2.3
➢ If had symptoms of TB , time point to seek treatment	When own treatment failed	63	12.0
	When symptoms & signs last for 3–4 weeks	103	19.7
	As soon as the symptoms might be related to TB	299	57.2

	Would not go to the doctor	39	7.5
	Do not know	19	3.6
➢ Preference of health facility	Government	157	51.3
	Private	149	48.7
➢ Reaction if self /known persons are found infected with TB	Fear	91	17.4
	Surprise	19	3.6
	Hopelessness	6	1.1
	Sadness	215	41.1
	Take it in a sportive manner	188	35.9
	Other	4	0.8
Total		**523**	**100.0**

Table 17.Reason for not going to government health facility

Reasons(n=149)	**N**	**%**
Long waiting time	76	51.0
Overlapping working hours	39	26.2
Distance	16	10.7
Others	18	12.1

RELATIONSHIP OF HEALTH SEEKING BEHAVIOR WITH DEMOGRAPHIC VARIABLES:

Proportion of population going to health facility for prolonged cough increased with decreasing age and increasing literacy and this was found to be statistically highly significant with $p<0.001$. (Table 18)

When they were asked about preference of health facility (Table 19) majority with higher educational status would prefer private health facility i.e., 87.8% of respondents with education of higher secondary and above would go to private compared with 43.4% of respondents with primary schooling or illiteracy. (P <0.001) **.**

Table -18 : Health seeking behavior – for prolonged cough

Demographic Variables	If had prolonged cough		Total	Chi-square value	P-value
	Go to health facility	Others[#]			
	N (%)	N (%)	N (%)		
Age Group					
15-35 years	178 (89.4)	21(10.6)	199 (100.0)	163.390	< 0.001
36-55 years	122 (48.4)	130 (51.6)	252 (100.0)		
56 + yrs	6 (8.3)	66 (91.7)	72 (100.0)		
Total	**306 (58.5)**	**217 (41.5)**	**523 (100.0)**		
Sex					
Male	156 (60)	104 (40)	260 (100.0)	0.474	0.491
Female	150 (57)	113 (43)	263 (100.0)		
Total	**306 (58.5)**	**217(41.5)**	**523 (100.0)**		
Education					
Illiterate / Primary School	83 (36.1)	147(63.9)	230(100.0)	87.023	< 0.001
Middle School + High School	174(72.8)	65 (27.2)	239 (100.0)		
Higher Secondary and above	49 (90.7)	5 (9.3)	54 (100.0)		
Total	**306 (58.5)**	**217(41.5)**	**523(100.0)**		

others includes going to pharmacy, pursuing self treatment options.

Table - 19 : Health seeking behavior - Preference of Health Facility

Demographic Variables	Preference of health facility		Total	Chi-square value	P-value
	Government	Private			
	N (%)	N (%)	N (%)		
Age Group					
15-35 years	85 (47.8)	93 (52.2)	178 (100.0)	1.259	0.262
36-55 years	70 (57.4)	52 (42.6)	122 (100.0)		
56 + yrs	2 (33.3)	4 (66.7)	6 (100.0)		
Total	**157 (51.3)**	**149 (48.7)**	**306 (100.0)**		
Sex					
Male	82 (52.6)	74 (47.4)	156 (100.0)	0.201	0.654
Female	75 (50.0)	75 (50.0)	156 (100.0)		
Total	**157 (51.3)**	**149 (48.7)**	**306 (100.0)**		
Education					
Illiterate / Primary School	48 (56.6)	36 (43.4)	83 (100.0)	17.265	< 0.001
Middle School + High School	104 (59.8)	70 (40.2)	174 (100.0)		
Higher Secondary and above	6 (12.2)	43 (87.8)	49 (100.0)		
Total	**157 (51.3)**	**149 (48.7)**	**306 (100.0)**		

DISCUSSION

The cross sectional study was carried out in an urban slum of Chennai. It aims at gaining an insight into the level of knowledge, attitude towards tuberculosis (TB) and health seeking behavior for TB symptoms among urban slum dwellers aged 15 years and above.

In the study area, risk factors for tuberculosis were prevalent. Overcrowding was present in 96% of households, poor socio-economic status (84.5% belonging to upper lower class according to modified kuppusamy scale) and one third of male population had the habits of smoking / alcohol intake which are considered to be an independent risk factors for pulmonary TB[55].

KNOWLEDGE ABOUT TUBERCULOSIS:

A few population based studies have highlighted the public awareness on TB from different parts of India. One such study from Jaipur (Rajasthan)[35] showed that 90% of illiterates were unaware about different aspects of TB. Present study also showed that literates were more aware about the various aspects of TB as compared to illiterates. Persons with literacy of higher secondary schooling and above had good TB knowledge

score (79.6%.) compared to illiterates and those with primary schooling (2.6%).

A study from a slum community of Delhi[33] highlighted that age, sex and economic status did not have significant influence on TB knowledge but present study clearly indicated that that younger age group and males have better knowledge when compared to older age group and females. This was statistically highly significant $p < 0.001$.

Present study revealed some lacunae in the knowledge and attitudes of slum dwellers about TB. Only 6.5% knew that a germ is the causative agent for TB. Similarly low percentage was also observed in the studies conducted in sandstone quarry workers (1.6%) [51] and the slum community of Delhi (2.3%) [33] (table). Still more than 50% had misconception that smoking and dirt were the cause for TB.

Majority of study population were well aware that TB is a communicable disease (85.5%), curable disease (84%) and diagnosis and treatment were provided free of cost (78.4%). These findings were comparable to similar studies conducted in a rural area in Delhi[50], sandstone quarry workers of Jodhpur[51], and slum community of Delhi[33].

Cough was the commonest symptom mentioned by respondents (72.5%) followed by fever (32.4%) and coughing up blood (10.7%). Except cough, respondents were having inadequate knowledge about the other symptoms of TB. (Table.21). From a programme point of view, the fact that knowledge about cough as a important TB symptom was encouraging but educating about the duration of cough has to be focused to ensure timely reporting and to improve passive case finding.

Although 88% knew the fact of availability of specific drugs for TB but only 15% were aware of the duration of treatment and also only 6.3% had heard about DOTS centre. These facts are discouraging from programme point of view and there is a need to improve the awareness about the place of diagnosis/ treatment and the duration of treatment. Studies with similar findings are given in Table.21.

In general, females, older population and individuals without schooling or with primary schooling were observed to be the groups with a significantly lower level of knowledge about the symptoms, transmission, diagnosis, treatment and prevention of TB. Overall TB knowledge score was higher among males, younger age group and respondents with higher schooling. Poor knowledge was also observed among smokers and alcoholics.

Table.21 Comparison of TB knowledge, attitude studies.

Variables	Present study	Study on delhi slum[33]	Endline KAP study-central TB division[56].	Study on general population – delhi[52]
• Symptoms of TB				
-Cough	72.5%	53.4%	77%	90.1%
-Fever	32.4%	43.7%	63%	---
-Coughing up Blood	10.7%	51.7%	57%	---
• Cause of TB-germ	6.9%	2.3%	---	---
• Diagnosis – sputum test	65.2%	----	60%	67.6%
• Treatment available.	88.1%	85.6%	----	90%
• 6-8 months of treatment	15.5%	12.6%	59.9%	57.5%
• Attitudes				
-Isolation	32.3%	70.7%	----	----
-Should Not breast fed	36.1%	47%	----	----
-Prohibit from Public Places	38.4%	15.5%	----	----

Only one fourth of respondents were informed about TB in the past month. In the study from Delhi[50], sources of information in more than half of the respondents were doctors and health workers, which was also true in the present study. In the present study, it was also found that hospital/ health worker were the major sources of information (50%) followed by mass media (26.6%). The influence of mass media like television and radio were not substantial in disseminating information on TB in the present study. This shows the importance of integrating all the available means of communication for reaching the people to disseminate the necessary information.

ATTITUDE AND HEALTH SEEKING BEHAVIOR:

TB is considered to be a social disease with medical aspect. Social factors play an important role in the management of TB patients. The stigma and fear associated with the disease often leads to delayed treatment seeking and poor adherence to therapy[53].

TB was perceived to be very serious and serious disease by 80% of study population. This perception may be encouraging in one end as we could expect more individuals to seek health care as early as possible but in other end it may reflect their fear, apprehension and stigma towards the

disease and this fact was also observed in the present study i.e only just over half of the respondents would seek for health care for prolonged cough. Even today persistence of these attitudes i.e., isolation, using separate utensils, prohibiting TB patients using public places etc., towards TB were disappointing (Table.21). Patients responded to these attitudes by isolating themselves and becoming secretive about their disease[54].

SUMMARY

A cross sectional study was carried out in P.P Amman kovil slum to find out the knowledge, attitude towards TB and health seeking behavior for TB symptoms among slum dwellers aged 15 years & above.

Among 530 individuals, majority had heard about TB (98.7%). Most were well aware that TB is a communicable disease (85.5%), curable disease (84%) and diagnosis and treatment were provided free of cost (78.4%).

The majority (72.5%) knew cough as a symptom. In most of respondents (83.7%) perceived Tuberculosis to be a preventable disease, citing the treatment of patients as the main- stay of preventing spread of the disease. Only 6.5% knew that germ is the causative agent for TB.

Only one fourth of respondents were informed about TB in the past month. Hospital/ Health worker were the major sources of information (50%) followed by mass media (26.6%).

Overall TB knowledge revealed no knowledge in 1.3%, poor knowledge in 25.4%, some knowledge in 57.2% and good knowledge in 17.4% of study population.

However, responses like using separate utensils or isolation of the patient (32.3%) to prevent the spread of the disease indicate persistence of stigma and discrimination in a small proportion of the population.

Only just over half of the study population (58.5%) would seek health care for prolonged cough. Majority (39%) would go to pharmacy for prolonged cough or using self treatment i.e., hot pepper water or herbs etc. and preference to go to government health facility would be only around 50%. Major reason (51%) for not going to government hospital was long waiting time.

The study concludes that females, older population and individuals without schooling or with primary schooling were observed to be the groups with a significantly lower level of knowledge about symptoms, transmission, diagnosis, treatment and prevention of TB. Poor knowledge was also observed in smokers and alcoholics. Overall TB knowledge and attitude towards TB was higher among males, younger age and higher schooling respondents. Concerted efforts should be taken to create awareness / knowledge about TB and also to change their negative attitude towards TB.

LIMITATIONS

1. The study was carried out in only one urban slum.
2. Health seeking behavior part of this study was elicited from apparently healthy individuals whose health seeking response may vary later.

RECOMMENDATIONS

Based on the results of this study, it was found out that there is still a need to strengthen the educational campaign on TB through mass media; because they are excellent venues for information- dissemination, there is a greater chance for better case detection. Information Education Communication (IEC) component of the programme should aim at disseminating comprehensive information on TB causation, transmission, prevention, diagnostic/treatment place particularly about DOTS centre and misperception associated with TB as well; combination of audio-visual and local popular media will be required to reach the targeted audience including the illiterate segment of the population.

TB control programme should particularly address the myths and various misconceptions regarding transmission of TB and its cure. Efforts should therefore be made to allay fear and apprehensions and reduce the stigma through ongoing IEC activities. Such deep rooted negative attitudes need to be dispelled through intensive health education campaign. So that social acceptability of the persons suffering from TB improves and people come forward to support these patients.

Setting up of Health education booths in the waiting rooms of various health facilities may be considered which provide counseling and advisory sessions on TB and distribute leaflets and pamphlets on various issues related with TB. Billboards and posters containing health messages related to TB should be displayed at various places of hospitals.

In the absence of proper health care infrastructure in urban slum areas utilization of non-governmental organizations, local leaders, local volunteers, students and private practitioners should be considered for IEC activities combined with behavior change communication (BCC). Health facilities and working places should be utilized to provide basic knowledge about TB. It may be necessary to establish more diagnostic facilities in TB prone areas. Train and motivate health workers to be actively involved in raising community knowledge and information regarding tuberculosis.

Concerted efforts in educating slum population for attitudinal change, active measures for early identification, sustaining treatment, minimizing defaulters through community participation are the need of the hour for controlling TB problem in high risk group population in the community.

ANNEXURE I

QUESTIONNAIRE

A STUDY ON KNOWLEDGE, ATTITUDE TOWARDS PULMONARY TUBERCULOSIS AND HEALTH SEEKING BEHAVIOR FOR PULMONARY TUBERCULOSIS SYMPTOMS AMONG URBAN SLUM OF CHENNAI.

PART I SOCIO-DEMOGRAPHIC PROFILE :

1. Name:

2.Age :

3.Sex: 1) ☐ Male
2) ☐ Female

4. Religion : 1) ☐ Hindu
2) ☐ Muslim
3) ☐ Christian

5. Education

Family member---------- Head of family----------

1) ☐ Illiterate
2) ☐ Primary School
3) ☐ Middle School 4) High School
5) ☐ Higher Secondary / Post High School Diploma `
6) ☐ Graduate/Post Graduate

6.Occupation

Family member---------- Head of family----------

1) ☐ Unemployed
2) ☐ Unskilled Worker
3) ☐ Semi Skilled Worker
4) ☐ Skilled worker
5) ☐ Clerk/ Shop Owner
6) ☐ Semiprofessional
7) ☐ Professional

7. Family income per month in rupees :

1) ☐ ≥19575
2) ☐ 9788-19574
3) ☐ 7323- 9787
4) ☐ 4894- 7322
5) ☐ 2936-4893
6) ☐ 980-2935
7) ☐ ≤ 979

8. Marital status:

1) ☐ Unmarried
2) ☐ Married
3) ☐ Separated
4) ☐ Divorced
5) ☐ Widowed

9. Type of Family:

1 ☐ Nuclear
2) ☐ Joint

10.Socio Economic Status

1) ☐ Upper class
2) ☐ Upper Middle class
3) ☐ Lower middle class
4) ☐ Upper lower class
5) ☐ Lower class

11.Personal habits

1) ☐ Smoking
2) ☐ Alcohol intake
3) ☐ Betel Nut Chewing
4) ☐ Tobacco Chewing
5) ☐ others--------

12. Overcrowding ---------- 1.☐ Yes
2.☐ No

Total no. of family members /total no.of rooms in the house ------/-------

PART IIA: PULMONARY TUBERCULOSIS KNOWLEDGE AND AWARENESS

1. Have you heard of tuberculosis ?
   1. ☐ Yes
   2. ☐ No

2. What are the symptoms of TB?

2a .If Cough –How Many Weeks?
   1. ☐ < 2 weeks
   2. ☐ > or = 2 weeks
   3. ☐ Don't know

3. What is the cause for tuberculosis ?
   1. ☐ Smoking
   2. ☐ Germ
   3. ☐ Dirt
   4. ☐ Hereditary
   5. ☐ Don't Know
   6. ☐ Others----------

4. Is it a communicable disease?--
   1. ☐ Yes
   2. ☐ No
   3. ☐ Don't Know

5.Which part of the body tuberculosis affect most ?
   1. ☐ Bone And Joints
   2. ☐ Lymphnodes
   3. ☐ Lung
   4. ☐ Brain
   5. ☐ Don't Know
   6. ☐ Others----------

6. How tuberculosis patient commonly get diagnosed?
   1. ☐ Blood Examination
   2. ☐ Sputum Examination
   3. ☐ Urine Examination
   4. ☐ X-Ray Chest
   5. ☐ Do Not Know

6. ☐ Others----------

7. How does tuberculosis spread in the community?

1. ☐ Through contaminated water
2. ☐ Through the air when a person with TB coughs or sneezes
3. ☐ Through direct contact with sputum of TB patients accidentally by touching or walk over the sputum
4. ☐ Through sharing dishes or eating from same plate of persons with TB
5. ☐ Do not know
6. ☐ Other (please explain):----------

8. In your opinion, who can be infected with TB?

1. ☐ Anybody
2. ☐ Only poor/homeless people
3. ☐ Only alcoholics
4. ☐ Only smokers
5. ☐ Do not know
6. ☐ Other (please explain):----------

9. Can TB be cured?

1. ☐ Yes
2. ☐ No
3. ☐ Don't know

10. How can someone with TB be cured?

1. ☐ Herbal remedies
2. ☐ Home rest
3. ☐ Praying
4. ☐ Specific drugs given by health centre
5. ☐ Do not know
6. ☐ Other:----------

10a. If specific drugs–for how many months these drugs should be taken?

1. ☐ < 6months
2. ☐ > or = 6 months
3. ☐ Don't know

11.In your opinion, how serious a disease is TB?

1. ☐ Very serious
2. ☐ Somewhat serious
3. ☐ Not serious

12. Have you heard about dots center?

1. ☐ Yes
2. ☐ No

13. Is hopitalization necessary for treatment of tuberculosis ?

1. ☐ Yes
2. ☐ No
3. ☐ Don't know

14. what are the methods to prevent transmission of TB from a patient to his/her family members?

1. ☐ Cough hygeine
2. ☐ Regular treatment
3. ☐ Isolation
4. ☐ Using separate utensils
5. ☐ Do not know
6. ☐ Other:----------

15. In the past month, have you received any information regarding tuberculosis— 1. ☐ Yes 2. ☐ No

if so, what was/were the source(s) of that information?

1. ☐ Health worker / hospital
2. ☐ Mass media i.e TV ,Newspaper, Radio
3. ☐ Relatives / friends
4. ☐ Others----------

16. How expensive do you think TB diagnosis and treatment is in tamilnadu?

1. ☐ It is free of charge
2. ☐ It is reasonably priced
3. ☐ It is somewhat/moderately expensive
4. ☐ It is very expensive
5. ☐ Don't Know

PART II B.ATTITUDE TOWARDS TUBERCULOSIS:

1. Do you think you can get TB ?

1. ☐ Yes
2. ☐ No
3. ☐ don't know

2. Can poor patients get cured of Tuberculosis ?- 1. ☐ Yes 2. ☐ No

3. ☐ Don't Know

3. Can persons with TB marry?
1. ☐ Yes
2. ☐ No
3. ☐ Don't Know

4. Should persons with TB be isolated?
1. ☐ Yes
2. ☐ No
3. ☐ Don't Know

5. In your area, how is a person who has TB usually regarded/treated?

1. ☐ Most people reject him or her
2. ☐ Most people are friendly, but they generally try to avoid him or her
3. ☐ The community mostly supports and helps him or her
4. ☐ Other (please explain):----------

6. Can persons with TB, visit public utilizing places like cinema hall, market, temple etc.,?
1. ☐ Yes
2. ☐ No
3. ☐ Don't Know

7. Can TB affected mother breast feed her baby?
1. ☐ Yes
2. ☐ No
3. ☐ Don't Know

PART III : HEALTH SEEKING BEHAVIOUR FOR PULMONARY TB SYMPTOMS

1. What would you do if you thought you had prolonged cough(> 2 weeks)?
1. ☐ Go to health facility
2. ☐ Go to pharmacy (medical shop)
3. ☐ Go to Indigenous practitioners (ayush)
4. ☐ Pursue other self-treatment options (herbs, etc.)
5. ☐ Other:----------

2. If you would go to health facility which health facility you would prefer ?
1 . ☐ Government
2. ☐ Private→ go to Q no:2a of part III

2a. If you would not go to the government health facility, what is the reason?

1. ☐ Non-availability of health personnel
2. ☐ Far from place of stay
3. ☐ Overlapping work hours with medical facility working hours
4. ☐ Long waiting time
5. ☐ Others----------

3. If you had symptoms of TB at what point would you seek treatment?
   1. ☐ When treatment on my own does not work
   2. ☐ When symptoms that look like TB signs last for 3–4 weeks
   3. ☐ As soon as I realize that my symptoms might be related to TB
   4. ☐ I would not go to the doctor-→go to Q no 2a of part III
   5. ☐ Do not know

3a. If you would not go to the health facility, what is the reason?
   1. ☐ Not sure where to go
   2. ☐ Cost
   3. ☐ Difficulties with transportation/distance to clinic
   4. ☐ Cannot leave work (overlapping work hours with medical facility working hours)
   5. ☐ Do not want to find out that something is really wrong
   6. ☐ Other (please explain):----------

4. What would be your reaction if you/known person of yourself were found out have TB?
   1. ☐ Fear
   2. ☐ Surprise
   3. ☐ Shame
   4. ☐ Hopelessness
   5. ☐ Sadness
   6. ☐ Take it in a sportive manner
   7. ☐ Other:----------

THANK YOU VERY MUCH FOR PARTICIPATING

ANNEXURE II

TB KNOWLEDGE SCORE

S.NO	QUESTIONS	SCORE
1	Symptoms of TB	
	Cough + /- other TB symptom(s)	1
	Others/ don't know	0
2	Cause of TB	
	Germ	1
	Others/ don't know	0
3	TB is communicable disease	
	Yes	1
	Others/ don't know	0
4	Part of body affected most by TB	
	Lungs	1
	Others/ don't know	0
5	Diagnosis of TB	
	Sputum examination	1
	Others/ don't know	0
6	Spread of TB	
	Airborne	1
	Others/ don't know	0
7	TB can be cured	
	Yes	1
	Others/ don't know	0
8	Treatment of TB	
	Specific drugs	1
	Others/ don't know	0
9	Duration of treatment	
	6-8months	1
	Others/ don't know	0
10	Who can be infected	
	Anybody	1
	Others/ don't know	0
11	Hospitalization is needed	
	No	1
	Others/ don't know	0
12	Prevention of TB Transmission	
	Cough hygiene or regular treatment or both	1
	Others / don't know	0
	Total score	12

ANNEXURE III

MODIFIED KUPPUSWAMY'S SOCIOECONOMIC STATUS SCALE

S.No	(A) Education	Score
1	Profession or Honours	**7**
2	Graduate or post graduate	**6**
3	Intermediate or post high school diploma	**5**
4	High school certificate	**4**
5	Middle school certificate	**3**
6	Primary school certificate	**2**
7	Illiterate	**1**

S.No	(B) Occupation	Score
1	Profession	**10**
2	Semi-Profession	**6**
3	Clerical, Shop-owner, Farmer	**5**
4	Skilled worker	**4**
5	Semi-skilled worker	**3**
6	Unskilled worker	**2**
7	Unemployed	**1**

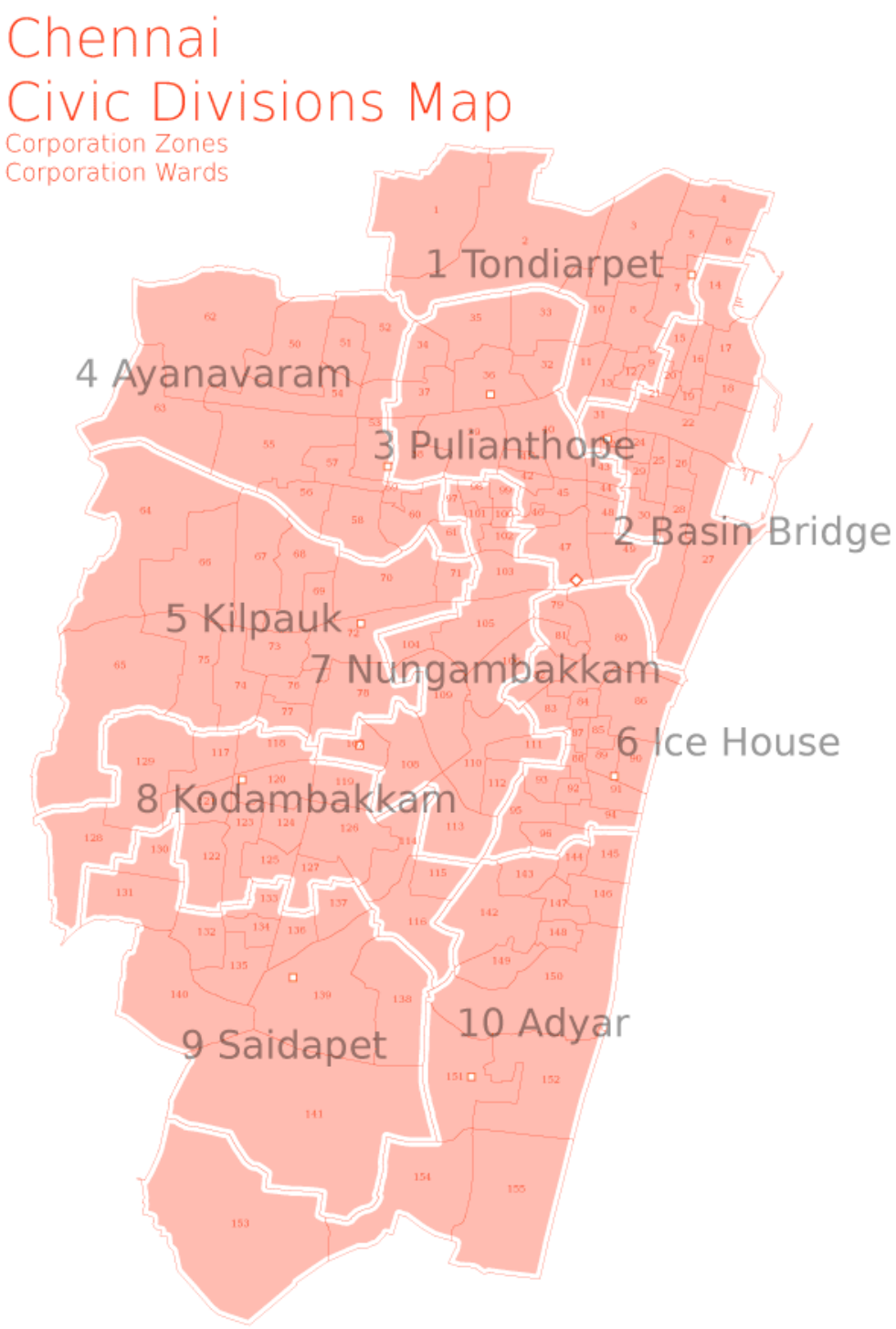
S.No	(C) Family income per month(in Rs)- modified for 2007	Score
1	≥19575	**12**
2	9788-19574	**10**
3	7323- 9787	**6**
4	4894- 7322	**4**
5	2936-4893	**3**
6	980-2935	**2**
7	≤979	**1**

Total Score	Socioeconomic class
26-29	Upper (I)

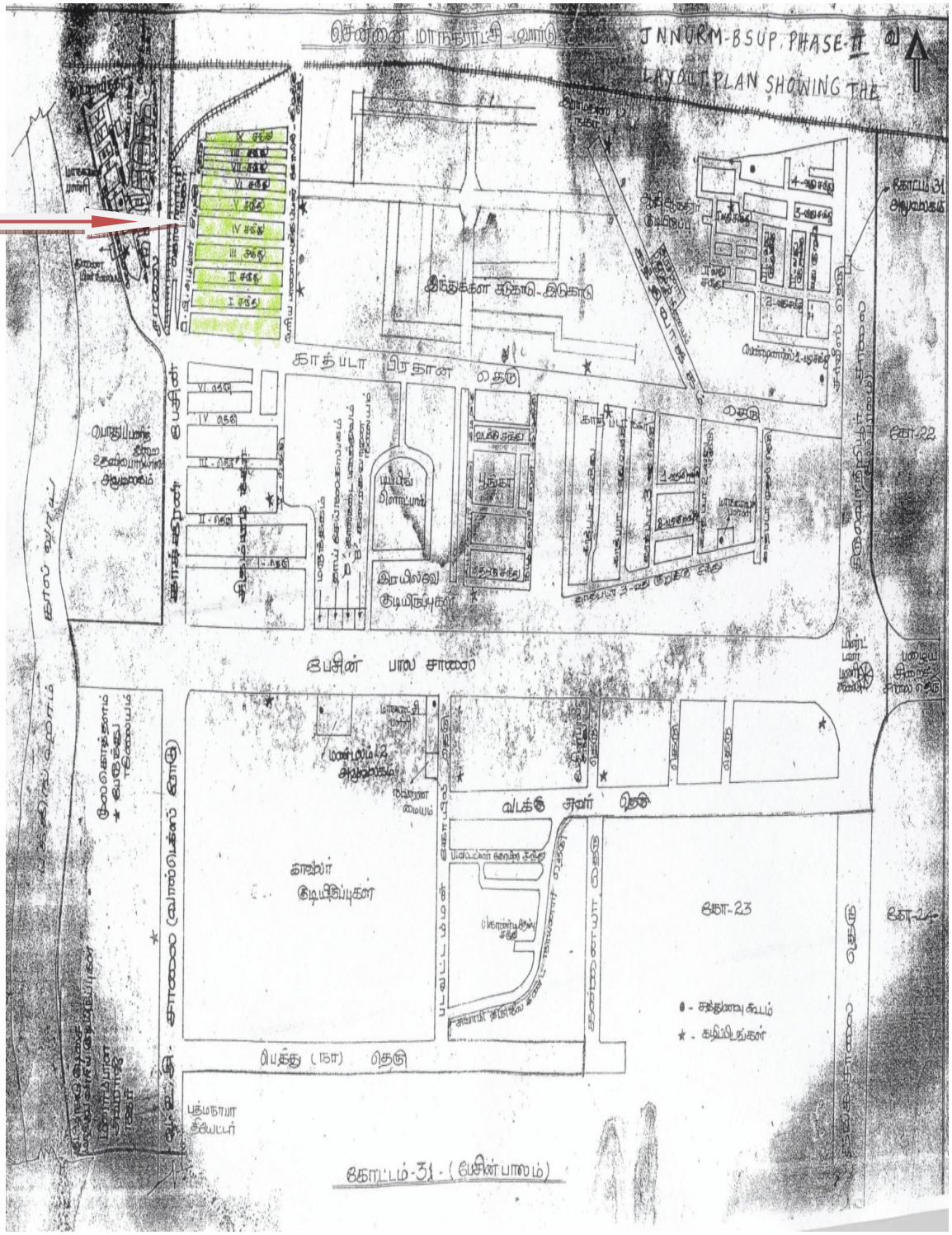
16-25	Upper Middle (II)
11-15	Middle Lower middle (III)
5-10	Lower Upper lower (IV)
<5	Lower (V)

ANNEXURE IV

ZONAL MAP OF CHENNAI CORPORATION


Chennai
Civic Divisions Map
Corporation Zones
Corporation Wards
1 Tondiarpet
2 Basin Bridge
3 Pulianthope
4 Ayanavaram
5 Kilpauk
6 Ice House
7 Nungambakkam
8 Kodambakkam
9 Saidapet
10 Adyar

AREA MAP



P.P.AMMAN KOVIL SLUM

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